REMARKS

Claims 2, 3, and 6 are objected to for informalities. Claim 1 has been amended to recite "within one or more transmembrane passageways" and provide antecedent basis for claims 2 and 3. A typographical error in claim 6 has been corrected.

Claims 7-24 have been rejected under 35 U.S.C. §112, second paragraph and under 35 U.S.C. §101. These claims have been cancelled and these rejections are now moot.

Claims 1-3 stand rejected under 35 U.S.C. §102(b) by a Hicke et al. article (*Novel enzyme-membrane reactor for polysaccharide synthesis*, Journal of Membrane Science (1999), Vol. 161, pgs. 239-245). Claims 4-6 are rejected under 35 U.S.C. §103(a) for obviousness over the combination of the Hicke et al. article in view of U.S. Patent No. 6,017,742 to Takenishi et al. The basis for both of these rejections is an assertion that Hicke et al. teaches altering endogenous carboxyl groups within a transmembrane passageway in a capillary-pore membrane. Applicants respectfully traverse these rejections for the following reasons.

The present invention uses a single step process of altering only endogenous carboxyl groups within a transmembrane passageway of a capillary-pore membrane. Claim 1 has been amended to clarify that feature. The Hicke et al. article is directed to a two step process for altering the properties of a capillary-pore membrane. These two steps include:

> Step 1: photo-grafting the pore surface within a capillary-pore membrane with a carboxylic or amino functional groups; and
>
> Step 2: immobilizing another species by activation of groups on the photo-grafted functional groups.

The Hicke et al. article only considers a process of first functionalizing the surface of a capillary-pore membrane's transmembrane passageways before immobilizing another species thereon. See, for example, the following descriptions of functionalizing the capillary-pore membrane prior to immobilization of a species therein.

> Abstract (emphasis added): Commercially available capillary pore membranes with diameters of 0.4, 1.0 and 3.0 μm **had to be modified** for covalent enzyme immobilization within the pores. [Steps 1 and 2]

> Page 240, col. 1: (ii) commercial symmetric microfiltration membranes (MFM) from non-reactive polymers after a heterogeneous photo-grafting functionalization of the pore surface with carboxylic or amino groups and sequential activation/coupling. [Steps 1 and 2].
>
> Page 241, col. 1: The PET MFM were functionalized by heterogeneous photoinitiated graft copolymerization of AEMA (40 g/l) from deaerated water solutions under nitrogen atmosphere using a BP coating on the membrane surface and selective UV irradiation. [Step 1]
>
> Page 241, col. 2: Activation of g-PAEMA amino groups was done with glutardialdehyde. [Step 2].

This process is described in paragraph [0007] of the published application, acknowledging the teachings of the Hicke et al. article as relating to a multi-step process which first requires chemical or physical modification of all of membrane surfaces to create a functional group followed by attachment of a molecule or particle otherwise of interest.

Contrary to these teachings, Applicants have discovered that it is possible to alter the properties of capillary-pore membranes by linking a compound to the membrane only using endogenous carboxyl groups that are inherent in one or more transmembrane passageways in a capillary-pore membrane. Claim 1 has been amended to clarify that the present invention relates only to the use of endogenous carboxyl groups within the transmembrane passageways of a capillary-pore membrane. Hicke et al. specifically reports the need to modify a capillary-pore membrane prior to immobilization of a species therein. There is no teaching to use a capillary-pore membrane without first pre-functionalizing the membrane before altering the functionalized membrane with a compound. Claim 1 recites that the alteration of the properties of a capillary-pore membrane includes only using endogenous carboxyl groups inherent within one or more transmembrane passageways of the membrane. As such, claim 1 and dependent claims 2-6 are not taught by the Hicke et al. article.

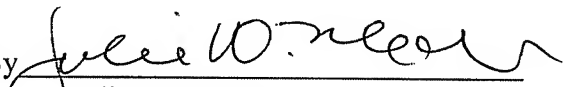
Moreover, Hicke et al. specifically teaches away from such a single step process as claimed, having no pre-treatment of the transmembrane passageway surfaces. Hicke et al. requires, in all circumstances, a two step (multi-step) process of first pre-functionalizing all the membrane surfaces to create a functional group as a point of attachment, which only then may be followed by covalent attachment of a molecule of interest. Accordingly, claims 1-6 define over the Hicke et al. article.

The teachings of the Takenishi patent provide no reason to modify those of the Hicke et al. article, particularly since Hicke et al. teach away from a one step process as claimed. The Takenishi et al. patent is relied upon for teaching a condensation reaction between carboxylic acid and amine or thiol groups to immobilize biologically active substances; it provides no reason to practice a method directly counter to the teachings of Hicke et al. Accordingly, claims 1-6 define over the prior art of record and are in condition for allowance.

Reconsideration of the rejections and allowance of claims 1-6 are respectfully requested.

Respectfully submitted,

THE WEBB LAW FIRM

By 

Julie W. Meder
Registration No. 36,216
Attorney for Applicants
436 Seventh Avenue
700 Koppers Building
Pittsburgh, PA 15219
Telephone: (412) 471-8815
Facsimile: (412) 471-4094
E-mail: webblaw@webblaw.com